Assignment 2

DSA0156-Object oriented programming

C++ Gaming

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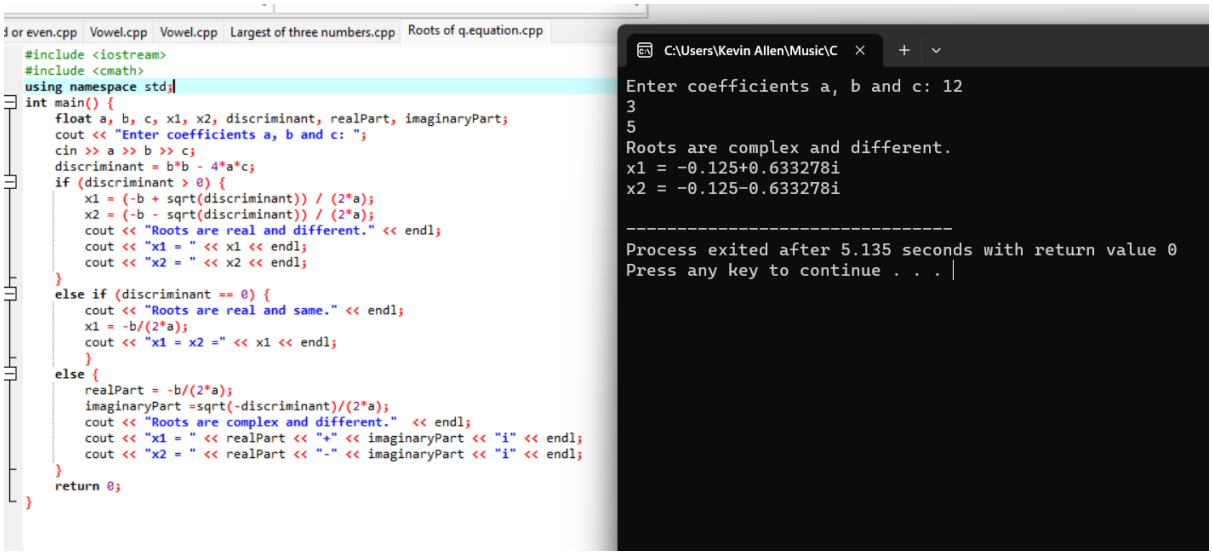
1. C++ Program to Find All Roots of a Quadratic Equation

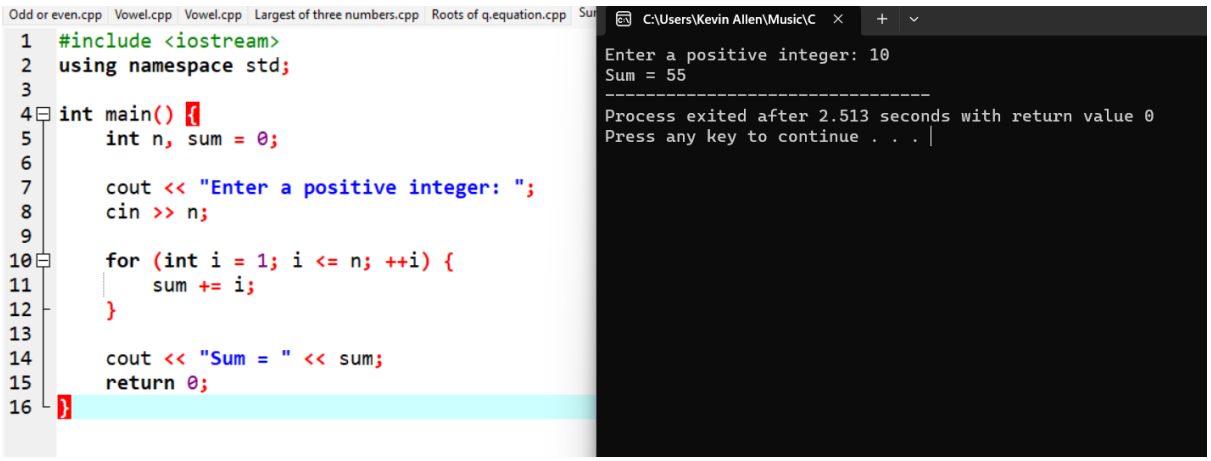


```cpp
#include <iostream>
#include <cmath>
using namespace std;
int main() {
    float a, b, c, x1, x2, discriminant, realPart, imaginaryPart;
    cout << "Enter coefficients a, b and c: ";
    cin >> a >> b >> c;
    discriminant = b*b - 4*a*c;
    if (discriminant > 0) {
        x1 = (-b + sqrt(discriminant)) / (2*a);
        x2 = (-b - sqrt(discriminant)) / (2*a);
        cout << "Roots are real and different." << endl;
        cout << "x1 = " << x1 << endl;
        cout << "x2 = " << x2 << endl;
    }
    else if (discriminant == 0) {
        cout << "Roots are real and same." << endl;
        x1 = -b/(2*a);
        cout << "x1 = x2 =" << x1 << endl;
        }
    else {
        realPart = -b/(2*a);
        imaginaryPart =sqrt(-discriminant)/(2*a);
        cout << "Roots are complex and different." << endl;
        cout << "x1 = " << realPart << "+" << imaginaryPart << "i" << endl;
        cout << "x2 = " << realPart << "-" << imaginaryPart << "i" << endl;
    }
    return 0;
}
```

```
C:\Users\Kevin Allen\Music\C
Enter coefficients a, b and c: 12
3
5
Roots are complex and different.
x1 = -0.125+0.633278i
x2 = -0.125-0.633278i

--------------------------------
Process exited after 5.135 seconds with return value 0
Press any key to continue . . .
```

2. C++ Program to Calculate Sum of Natural Numbers



```cpp
#include <iostream>
using namespace std;

int main() {
    int n, sum = 0;

    cout << "Enter a positive integer: ";
    cin >> n;

    for (int i = 1; i <= n; ++i) {
        sum += i;
    }

    cout << "Sum = " << sum;
    return 0;
}
```

```
C:\Users\Kevin Allen\Music\C
Enter a positive integer: 10
Sum = 55
--------------------------------
Process exited after 2.513 seconds with return value 0
Press any key to continue . . .
```

3.C++ Program to Check Leap Year